**Name and brief description of initiative:**
<u>**Theoretical and Computational Neuroscience Research Program**</u>, National
Institute of Mental Health, NIH

**Brief description of goals of initiative:**
The Program supports research on the development and application of realistic
models for the analysis and understanding of brain function. Project areas include
empirical and theoretical studies of self-organizing behavior in neuronal systems,
mathematical approaches to modeling non-stationary neuronal processes, functional
imaging of dynamical processes, and the modeling of all levels of neuronal
processing, from single cell activity to complex behaviors. Grant applications are
encouraged for research projects combining mathematical and computational tools
with neurophysiological, neuroanatomical, or neurochemical techniques in order to
decipher the mechanisms underlying specific neuronal and behavioral systems. This
program also supports research projects focusing on understanding the computations
made by nerve cells and groups of nerve cells in orchestrating behaviors.

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**Website address of initiative:** http://www.nimh.nih.gov/dnbbs/72-nbt.cfm

**Brief description of biomedical informatics and computational biology
components and their goals:**
     Creating biologically realistic computational models of neural processes
underlying all aspects of brain activity − from single cells to networks to systems to
behavior.
     Understanding how individual differences in neuronal activity (variability) are
involved in the transmission and processing of information in the central nervous
system.
     Measuring the associations among neurons and establishing a theoretical
basis, rationale, and validation for spike sorting procedures.
     Enhancing the analysis and interpretation of local field potentials both in
conjunction with and apart from neural spike train data.

**Interactions with other initiatives:** The program participates in new and ongoing
initiatives, program announcements and requests for applications, pertaining to the
study of computational neuroscience.  Recent activities include the jointly sponsored
NSF/NIH Program, Collaborative Research in Computational Neuroscience,
http://www.nsf.gov/pubs/2004/nsf04514/nsf04514.htm, with nine NIH Institutes, five
NSF Directorates and three outside agencies.

Prepared by D. Glanzman 06/27/2006